



**Third United Nations
International Conference
on the Peaceful Uses
of Atomic Energy**

A/CONF.28/A/726
NETHERLANDS

February 1964

Original: ENGLISH

Confidential until official release during Conference

Abstract

The Norwegian-Netherlands' fuel irradiation project*)

R.G. Schölvinnck, P.F. Sens

Reactor Centrum Nederland, Petten, the Netherlands

E. Jensen

Institutt for Atomenergi, Kjeller, Norway

Since 1962 experimental UO_2 fuel irradiations have been performed in a loop in the High Flux Reactor at Petten. The H.F.R. is an enriched uranium fueled, light water cooled, materials testing reactor, operating at a power of 20 MW.

The purpose of the experiments is to study the behaviour of UO_2 fuel, irradiated at high specific power to a high burn-up. Fuel capsules between 10 mm and 15 mm diameter are contained in a pressure tube, located in one of the beryllium reflector elements, adjacent to the reactor core. The in-pile section is of the re-entrant thimble type.

Dependent on location the effective thermal neutron flux in the fuel capsules is between 0.8 and $1.5 \cdot 10^{14}$ n/cm²sec. Loop equipment and instrumentation are in the basement of the reactor building in a special shielded cubicle.

Operation of the loop has been satisfactory so far. Fuel ratings have been achieved up to 750 W/cm fuel length (kdT = 60 W/cm) and fuel exposures in excess of 10,000 MWD/tonne.

The post irradiation facilities consist of two lead cells (7" and 10" wall thickness) of the box in a cell type. Results of the post irradiation measurements will be presented. They include measurements on the change in dimensions of the fuel capsules, on the release of fission gases, on the burn-up, on grain growth and further metallographic observations.

*) Work carried out at Petten, The Netherlands, as a joint project of the Norwegian Institutt for Atomenergi and Reactor Centrum Nederland.